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Vertebrates" and especially of the mammoth. Mr. Gilmore notes the conditions under which the fossils occur and presents an extremely clear and convincing suggestion as to how the Siberian mammoths became imbedded in ice, a suggestion that calls for no sudden and widespread glaciation and no great beds or ponds of ice. Mr. Gilmore gives a summary of our knowledge of the Pleistocene mammals of Alaska and the localities where they were found, and gives the particulars of the finding of two teeth of the mastodon near Dawson.

IN *The Museums Journal* of Great Britain for May, Professor Geddes discusses "The Museum and the City—A Practical Proposal," to interest the public by devoting special attention to illustrating by maps, models and documents the past history of a city and suggest plans for its future improvement. W. B. Barton has "Thoughts on the Equipment of an Art Gallery and Museum" and S. L. Moseley has some notes on "Preserving Plants in Natural Form."

NOTES ON ENTOMOLOGY

THE recent parts of Wytsman's "Genera Insectorum" include the hymenopterous family Trigonaloidæ (fascicle 61) by W. A. Schulz, 24 pp., 3 pls. The author has been fortunate in examining nearly all of the available material in this small family, so that all but three species are placed in the system. A number of new genera are established, mostly at the expense of *Trigonalys*. Fascicle 62 is by Dr. Schmiedeknecht on the parasitic Hymenoptera of the subfamily Pimplinæ, 120 pp., 2 pls. The author adopts the usual tribes, but the arrangement of genera is quite different from that of Ashmead. He makes no new genera, but accepts most of those of Ashmead; however he drops many of Förster's genera. Over 1,500 species are catalogued, of which 340 are in the genus *Pimpla*. Fascicle 63 is on a small group of tropical butterflies, the subfamily Dioninæ of the family Nymphalidæ. H. Stichel is the author, 38 pp., 3 pls. Fascicle 64, a ponderous volume of 487 pages, treats of the tiny beetles of the family Pselaphidæ. The author is A. Raffray, who has

devoted his whole attention for many years to these insects. Over 3,000 species are arranged in the 452 genera. There are nine plates, three exhibiting the structural details, and the others show about 80 species, drawn by the author. M. Raffray considers that the 3,000 known species are not one third of the existing forms.

THE British Museum has long been considered the greatest in the world. Recently it has published an account of its collection.¹ There are lists of the accessions for each year, the number of species and specimens in each order, and the number of boxes for each family. The number of types in each accession is often mentioned, and the persons who revised and arranged each group. The entire number of insects (1904) was 1,018,000 specimens. By orders as follows:

	Specimens	Named Species
Lepidoptera	355,767	41,210
Coleoptera	398,000	67,300
Hymenoptera	132,000	19,600
Hemiptera	57,650	11,700
Diptera	46,900	7,377
Orthoptera	18,800	3,900
Neuroptera	9,056	1,864
Aptera	140	21

The largest collection ever received was the famous Bowring collection of Coleoptera, 230,000 specimens; the next, Stephens general collection, 90,000 specimens; the third, 51,130 Lepidoptera of the Leech collection; the fourth, 45,000 Coleoptera, with over 3,000 types from the Pascoe collection.

MEIGEN's first work, a classification of flies, has been one of the rarest of entomological publications. Owing to this and to the fact that Meigen himself abandoned them, the genera there presented have rarely been accepted, but recourse was taken to later and more extensive works of this author. Dr. F. Hendel has now republished the paper, with numerous commentaries and references under

¹ "The History of the Collections contained in the Natural History Departments of the British Museum," 2 vols., 1905-7. Insecta, Vol. II., pp. 550-653.

each genus to its equivalent in Meigen's paper in Illiger's Magazine of 1803.² Now being available to all, the paper will doubtless kindle many nomenclatorial controversies. According to Hendel, there will be changes in 47 generic names. It would be of great advantage to entomologists, if others, who have access to rare papers, would follow the example of Dr. Hendel and republish them.

MR. R. SHELFORD has described a strange new genus of Diptera,³ which shows still more than its allies a deceptive resemblance to the cockroaches. The creature is wingless, with deflected head, small eyes, no ocelli, an enlarged globular basal antennal joint, reduced mouth parts, flattened femora, no tarsal pulvilli, and the venter of the abdomen shows no segmentation. It comes from Africa, but nothing further is known about its occurrence.

THE third and concluding part of the Monograph of the Phasmidæ or stick insects has been issued.⁴ This part contains the tribes Phibalosomini, Acrophyllini and Necrosciini, and is all by Redtenbacher. There are a great many new species described from his own collection, or from continental museums. Unfortunately he has omitted many species described in the last few years by American writers. The plates, by the author, well represent the remarkable structures of these marvels of insect life.

MR. V. E. SHELFORD, who for several years has been gathering ethologic material on the tiger beetles, has published the first of a series of articles upon this attractive group of insects.⁵ There are notes on the habits of

various species occurring in the vicinity of Chicago. The life history is given of *C. purpurea*, and more or less completely for *C. cuprascens*, *C. lepida*, *C. punctulata*, *C. sexguttata*, *C. hirticollis*, *C. scutellaris*, *C. tranquebarica*, *C. duodecimguttata*, *C. repanda*, *C. generosa* and *C. limbalis*. The plates show the larvæ, their burrows, the pupal cell, and the head and prothorax of the larvæ of the species; the position of the bristles on these parts furnish good distinguishing characters.

OF all our families of Homoptera the Fulgoridæ are perhaps the least known. Several years ago Mr. E. P. Van Duzee studied one group of them, and lately he has taken up some of the larger forms.⁶ Descriptions are given of many new species from various parts of the United States, and tables to the subfamilies, several genera and some of the species. The same author, as the result of a brief trip to the island of Jamaica, has published a list of the Hemiptera of that island.⁷ Nearly fifty species are described as new in the list of over 230 collected on the trip. Dr. O. M. Reuter has elsewhere described some of the Capsidæ taken by Mr. Van Duzee in Jamaica. And in the same society Mr. Van Duzee has published a comprehensive review of our tree-hoppers.⁸ Synoptic tables are given to the genera and usually to the species. The author has placed more reliance upon the shape of the prothorax than many writers. It is hoped that the paper will lead to a monographic treatment in the near future.

DR. W. M. WHEELER has contributed two more articles to the ant fauna of our country. One, a revision of the Myrmecocysti⁹ or

Tiger-beetles (Cicindelidæ)," *Journ. Linn. Soc. Lond. Zool.*, XXX., pp. 157-184, 4 pls., 1908.

⁶ "Studies in North American Fulgoridæ," *Proc. Acad. Nat. Sci. Phil.*, f. 1907, pp. 467-498, 1908.

⁷ "Notes on Jamaican Hemiptera," *Bull. Buffalo Soc. Nat. Sci.*, VIII. (No. 5), 79 pp., 1907.

⁸ "Studies in North American Membracidæ," *Bull. Buffalo Soc. Nat. Sci.*, IX., pp. 29-129, 2 pls., 1908.

⁹ "Honey Ants, with a Revision of the American Myrmecocysti," *Bull. Amer. Mus. Nat. Hist.*, XXIV., pp. 345-397, 1908, 28 figs.

² "Nouvelle classification des mouches à deux ailes (Diptera L.) d'après un plan tout nouveau," par J. G. Meigen, Paris, an VIII. (1800). Mit einem Kommentar herausgeben von F. Hendel, *Verh. zool.-bot. Ges. Wien*, 1908, pp. 43-69.

³ "*Ænigmatistes africanus*, a New Genus and Species of Diptera," *Journ. Linn. Soc. Lond. Zool.*, XXX., 150-155, 1 pl., 1908.

⁴ "Die Insektenfamilie der Phasmiden," Leipzig, 1908, pp. 341-589; 12 pls., folio; by K. Brunner v. Wattenwyl and J. Redtenbacher.

⁵ "Life Histories and Larval Habits of the

"honey ants," is especially attractive because of the accounts of the habits of all the known honey ants of the world. These honey ants have one form in which the abdomen is swollen by stored honey. Such forms occur in six widely separated genera. Our *Myrmecocystus* belong to two species, each with several subspecies and varieties; they inhabit the arid regions of Mexico and the southwestern United States. The other paper is an annotated list of the ants of Texas, New Mexico, and Arizona.¹⁰ More ants occur in this region than in all the rest of the United States; 101 species being recorded in this first paper, 41 of which are in the genus *Pheidole*. There are many notes on the habits of the various species, and descriptions of several new forms.

COL. T. L. CASEY has again published on the darkling beetles.¹¹ This time on the *Coniontinæ*, a group of moderate-sized insects found in the western states. About two hundred species are treated in synoptic form, more than half are described as new, and almost all are recorded from but one locality. Several new genera are based on species closely allied to *Eusattus* and *Coniontis*.

MAKING its initial appearance in the familiar garb of the French society comes the *Bulletin de la Société Entomologique d'Égypte*. It is published at Cairo in French, and under French auspices. Fascicle 1 has forty pages, and among other articles is one on the beetles found in the Egyptian mummies.

NATHAN BANKS

SPECIAL ARTICLES

REGIONS OF MAXIMUM IONIZATION DUE TO GAMMA RADIATION

1. I have recently standardized the fog chamber by the aid of Thomson's electron. The method (as will be shown elsewhere) is

¹⁰ "The Ants of Texas, New Mexico and Arizona," *Bull. Amer. Mus. Nat. Hist.*, XXIV., pp. 399-485, 1908, 2 pls., Part I.

¹¹ "A Revision of the Tenebrionid Subfamily Coniontinæ," *Proc. Wash. Acad. Sci.*, X., pp. 51-166, 1908.

not only expeditious, but leads by inversion, when my old values of the nucleations of the coronas are inserted, to values of e which agree with Thomson's and other estimates. This affords an incidental check on the broader bearings of the work. Thus a series of rough tests made in this way showed $e \times 10^{10}$ to lie between 3 and 4 els. units, agreeing closely enough with the accepted values to prove that both the positive and the negative ions are captured in my fog chambers, even at very high nucleations (500,000 per cu. cm.).

2. The experiments themselves run smoothly and take but a few minutes each; but there is an *inherent* difficulty involved in the interpretation of the distributions of ionization observed in the fog chamber. The radium (10 mg., 100,000, contained in a small thin sealed glass tube) is introduced into the inside of a cylindrical fog chamber, by aid of an aluminum tube (walls 1 mm. thick and about one quarter of an inch in diameter), thrust axially from one end to the other of the horizontal chamber. The inner end of the aluminum tube is thoroughly sealed; the other end lies quite outside the fog chamber, is open, and serves for the introduction of the radium tube. In this way the latter may be moved axially from the glass end of the fog chamber on the right of the observer, to the metal cap which closes the fog chamber on the left.

When the radium is successively placed at distances of about 11 cm. apart within the available 45 cm. the length of the fog chamber, the maximum nucleation (ionization) coincides with the position of the radium when both are near the glass end of the chamber (12 cm. in diameter). The nucleation then falls off rapidly and at first uniformly from the glass end to the metal end, where the coronas are strikingly smaller and the nucleation less than one half of that observed at the glass end. Considered alone, this would appear like the natural effect of an increasing distance from the source, except that the coronas near the distant end approach a constant diameter.

When the radium is moved about 12 cm.